A block carton with finish coating

The present invention relates to a cover for a block carton, wherein a surface is coated with a coating in order to thereby control the water permeation through the surface.

BACKGROUND OF THE INVENTION

Block cartons are used for packing fresh foodstuffs prior to freezing, eg within the fish processing industry for the freezing of fish or fish products in blocks. The block carton is conventionally manufactured in the form of a plane cover with pre-embossed folding lines. Such cover is also known within the industry under such designations as "fishblock-liner" or "blanket". Such cover consists of a bottom panel with a front and a rear side panel and two opposed end side panels, also designated end panels; wherein a panel, typically the rear panel, is connected to a side on a lid panel; and wherein the lid panel can be provided with one or flaps along the remaining sides of the cover. In order to ensure the best possible closure of the carton when erected (folded) in a freezing frame, the side panels may be provided with corner segments in the form of corner flaps attached to a single side panel, as described in eg WO 97/11890. Such closure of the corners prevents liquid from being discharged from the erected carton and, likewise, the contents are protected against damage (freeze burn) during the subsequent freezing process. The various panels are preferably connected to each other in correspondence with said pre-embossed folding lines.

Typically, the cover is made from multilayer cardboard or carton (typically 5-10 layers) and coated with paraffin on its one or both sides. This paraffin coating contributes considerably to the functional properties of the block carton in connection with the freezing process as it contributes to the control of absorption and emission of liquid to and from the cardboard material of the

block carton. More specifically it is desirable that a certain amount of liquid is absorbed from the food product during the freezing process, and therefore the inside of the block carton is configured with a view to controlling this absorption of liquid, eg by providing an internal paraffin coating with a large number of very small apertures, the so-called pinholes. The number and dimensions of the apertures is determined on the one hand by the type of food product it is desired to freeze, on the other by the structure of the selected cardboard material, ie the number and type of cardboard layers. Apart from serving the purpose of controlling the permeability to water vapour and liquid, the internal coating also serves to prevent that the food product in question adheres to the packaging by freezing. This property is a function of both the fundamental properties of the coating material and the structural configuration of the surface. To the latter condition it applies that the variation that results from a large number of small apertures reduces the risk of adherence by freezing.

Albeit the overall area of the apertures in the internal paraffin coating is comparatively small, an open outer surface would entail an undesirable drying of the food product; and consequently it is necessary to prevent leaks of liquid and evaporation from the surface of the block carton. Conventionally this was accomplished by means of a sealing with an undisturbed paraffin coating, whereby the permeation of water through the outer surface of the block carton has been reduced to a minimum.

The above-described cover is usually used in combination with a freezing frame intended therefor and consisting of a frame with sides corresponding to the side panels and having an opening corresponding to the bottom panel of the cover. The frame can be configured with a bottom or it may be used on a surface that thus constitutes a bottom of the frame. The inner sides of the frame are oriented approximately perpendicular to the bottom. When the bottom panel of the cover is pressed down into the opening of the frame, the

side panels will erect and abut on the inner sides of the frame and, likewise, the lid will be erected to an open position. Hereby an open block carton is created. Now the block carton is charged with the desired product, eg fresh fish, following which the lid is folded down to close the block carton. Then the closed block carton is frozen for eg three hours, following which the block carton is discharged from the freezing frame and the operator performs a visual control to verify whether the carton is closed correctly, ie a control whether the corner flaps and the side flaps of the lid are situated on the outside of the block carton.

It should be noted that it is important that the corner flaps and the side flaps of the lid are situated on the outside of the carton, since it is undesirable that they are embedded in the frozen fish or the like. This would mean that, upon removal of the carton from the frozen product, a part of the carton may – more or less visibly – remain in the product, which is undesirable for obvious reasons.

The work involved in erecting the block carton in the freezing frame is conventionally performed manually, whereby the above-described mistakes may readily occur, in particular in view of the very high speed of work. However, it is also an option to erect the block carton by use of machinery.

The problem of avoiding that parts of the block carton are embedded in the fish or the like during freezing has been attempted solved in a variety of ways.

Thus, WO 96/02422 teaches a block carton as described above and provided with indications on the cover corresponding to the outsides of the folded carton, said indications becoming visible in case of erroneous closure of the block carton. The drawback of this block carton resides in that the visual inspection of the block carton cannot be performed until after discharge of the

block from the rectangular freezing frame, ie following loading of the carton with fish or the like, closing and freezing. In case of erroneous closure of the block carton it is thus required that the carton is initially emptied of fish, following which the fish needs to be thawed and the charging process is to be performed all over again. In case of erroneous closure of the block carton it is thus associated with a heavy work load to remedy such erroneous closure.

WO 97/11890 discloses a block carton as described above which is provided with indicators on the cover corresponding to the inner sides of the folded cartons, said indications becoming visible in case of erroneous closure of the corner flaps of the block carton. Indications of this type enable control of correct folding prior to filling of the carton.

A third option would be to use both the above-described indicator systems on the same cover, which would facilitate control during as well as after completion of the work.

As will appear it is thus possible to locate indications in various ways and, likewise, it is possible to provide the packaging with other information in the form of text or graphics. However, it is a problem in this context that it is necessary to print a desired indication or information directly on the cardboard material prior to coating with paraffin, since the paraffin coating is not suitable for printing. This means that a paraffin coated block carton is an "end product" that it is not possible to change.

DESCRIPTION OF THE INVENTION

With starting point in the above-described problem, it is an object of the present invention to provide a cover for a block carton that enables more rationalised and flexible production.

According to the present invention this is accomplished with a cover for a block carton, wherein a surface is coated with a finish in a water-insoluble form. This involves a number of advantages from a point of view of production technique, since it will be possible to print matter on the packaging following application of the finish – provided, of course, that the selected printing ink is compatible with the finish. The finish preferably being clear, it will, of course, also be an option to print directly on the packaging and, likewise, print on and underneath the finish will be possible. As will appear, hereby a larger degree of freedom in the production process is accomplished and, likewise, it will be possible to make changes to already "finished" products.

The above advantages relate primarily to the process of manufacture, but it is also a considerable advantage that it will be possible, with a surface coated with finish, to provide the packaging with information in connection with the packing as such, eg a date stamp. This may be accomplished eg by means of conventional printing techniques or by means of an ink-jet printer device. A further advantage would be that the finish-coated surface will enable positioning of self-adhesive labels that usually adhere poorly to a paraffin surface.

The above-referenced technical printing conditions relate primarily to the outer side of the packaging, but corresponding to a preferred embodiment, the cover is coated with a finish on both the outer and the inner side, wherein the latter comprises a large number of relatively small pinhole openings. The term "relatively small" is to be understood that the openings have an average size corresponding to a diameter of less than 5 mm, more preferably less than 3 mm and most preferably less than 1 mm. The openings preferably constitute less than 20 percent of the total surface, more preferably less than 10 percent, and most preferably less than 5 percent.

In accordance with a preferred embodiment, a water-based and hardenable/setting finish is applied, such that the use of organic solvents is obviated.

It is a further advantage of using a finish for surface treatment that the options of recycling the packaging following use are considerably improved. It will, of course, always be desirable to recycle paper substances, but practice has shown that it is very difficult to remove the paraffin, and therefore, in practice, recycling has not taken place. As opposed to this, a thin layer of finish (eg corresponding to an amount of 10 g/m^2) will not prevent this. In this context, it should be mentioned that also the plastics coating typically used for surface treatment of packaging for alimentary use will make recycling difficult.

As mentioned above, it is essential that the outer surface of the packaging is made substantially non-impermeable to water vapour/liquid; meaning, in practice, a permeability value of less than 20 g/m^2 at 23°C and 50% relative humidity, preferably less than 10 g/m^2.

The invention will be explained in further detail in the following with reference to the drawing, wherein

Figure 1 is a perspective view of the inner side of a non-folded cover for a first block carton, seen from above;

Figure 2 is a perspective view of the inner side of a non-folded cover for an alternative block carton, seen from above; and

Figure 3 is a perspective view of the second cover folded to form a block carton, seen from above.

DESCRIPTION OF PREFERRED EMBODIMENTS

All figures are schematic and not to scale and they only show details that are of importance to the understanding of the invention, while other details have been omitted for the sake of overview. In all figures, the same reference numerals are used for the same or corresponding parts.

Figure 1 shows a cover 1 for a block carton prior to folding. The cover 1 is, in the embodiment shown, manufactured from multilayer cardboard and configured with a view to being used in connection with the freezing of fish. The cardboard is surface treated on both its inner and its outer side, as will be subject to more detailed description below.

The cover 1 is constituted by a front side panel 2 which is, along its one side, connected to a rectangular bottom panel 3. The bottom panel 3 is moreover connected to two end side panels 4, 5 and a rear side panel 6. The rear side panel 6 is yet again connected to a rectangular lid panel 7 being, along its side, provided with lid side flaps 8, 9 and along its front edge connected to a lid flap 10.

All of the above elements are connected to each other in correspondence with pre-embossed folding lines or so-called carton bridges 11 that are, in Figure 1, shown by dashed lines. Hereby it is to an ensured to an increased degree that the block carton is folded correctly during the erection or folding process. The distance between the free edges of the side panels and their connection to the bottom panels is referred to as the height of the side panel.

The bottom panel 3 of the cover is, as mentioned above, connected to side panels 4, 5, 6 that are essentially rectangular and of the same height. Corresponding to the four corners of the bottom panel, the cover is provided with corner segments 14 that are, via two carton bridges, connected to the

two adjoining side panels. As will appear from Figure 1, the corner segments thus fill the area between the side panels. The corner segments are provided with folding lines 15.

Since the side panels are all to be erected perpendicular in relation to the bottom panel. The carton bridges that connect the side panels to the corner segments are all arranged perpendicular to the carton bridge that connects the individual side panel to the bottom panel. Therefore, each corner segment is provided with a folding line 15 that halves the angle of 90° between the two carton bridges at which the corner segment is connected to the adjoining side panels.

Figure 2 shows an alternative embodiment of a cover that corresponds essentially to the above-described; differing, however, in that corner segments are connected by only one single carton bridge to an adjoining end side panel. Besides, the corner segments are configured with a visual identification (indicated by hatching) on the shown side.

As taught initially, the two sides of the cover are configured specifically with a view to serving as the inner and outer side, respectively, of the folded block carton. In Figures 1 and 2, the covers are shown with the side facing upwards that is configured to serve as inner side of the folded block carton, corresponding to Figure 3 in which a block carton is erected from the cover shown in Figure 2. It should be noted that the carton is not erected correctly since, as will appear, the corner segment 14 in the far corner, is located on the inside of the side panel 6.

In correspondence with the invention, at least one of the sides of the cover is coated with a finish in a water-insoluble form, wherein the side can be entirely or partially coated. For instance, the outer sides need not be coated since they are covered by lid flaps or lid side flaps, when the lid is closed, but

for reasons of manufacture technique a coated surface will preferably be coated in its entire expanse.

A mentioned initially, the outer coating of a cover for a block carton serves primarily to seal the surface and make it essentially impermeable to water vapour and liquid, wherein the internal coating is configured with a view to allowing controlled absorption of liquid in the cardboard through pinhole apertures 20 configured in the inner coating. Apart from serving to control the permeability to water vapour and liquid, the inner coating also serves to prevent that the food product in question freezes onto the packaging. In the figures the openings are shown only in a small area, but preferably the entire inner coating comprises corresponding openings.

Depending on the parameters (eg the given type of food product, its contents of liquid, the rate of freezing), the propensity to freeze onto the packaging will vary, and it follows that in some cases it will be necessary to use the "conventional" paraffin coating for the inner side, while, in other cases, it will be possible to use finish (also) on the inner side. Obviously the most important advantages are obtained, from a point of view of technique of manufacture and environment (eg in connection with recycling), when all coated surfaces are coated with a finish.

The finish is preferably in the form of a hardenable/setting water-based varnish eg Barritech 870 which is a thermosetting, anionic microdispersion marketed by BIM Kemi AB, Stenkullen, Sweden. This varnish ensures a value of permeability of water of less than 10 g/m^2 at 23°C and 50% of relative humidity by application of 8g/m^2 varnish (dry matter) on a surface and has proved to be suitable for coating covers for block cartons, and likewise, it is FDA approved.